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ABSTRACT

A study was conducted to examine how different kinds of children's nonverbal behavior developed across grade levels. The six kinds of behavior studied were (1) proxemic, or observance of personal space; (2) haptic, or touching behavior; (3) oculosic, or gazing; (4) kinesic, or interpreting emotions from facial expressions; (5) vocalic, or identifying emotions from vocal cues; and (6) behavior stemming from perceptions of physical appearance. Nine hundred and one teachers from all grade levels were asked to indicate what percentage of their students engaged in each of 64 nonverbal behaviors. The results indicated that observance of personal space increased with grade level, while interpersonal touching decreased except for sexual touching. The gazing variables indicated no developmental increase, with students at all levels maintaining eye contact when speaking and when spoken to. The kinesic variables also showed no developmental pattern, although smiling appeared to decrease until grade seven, then fluctuate through grade 12. The ability to identify emotions from vocal cues steadily increased with grade level. There was also a developmental pattern for the physical appearance variables, with avoidance of overweight children and concern about dress increasing with grade level.

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THE DEVELOPMENT OF NONVERBAL COMMUNICATION BEHAVIOR
IN SCHOOL CHILDREN, GRADES K-12

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Research on nonverbal communication in the classroom has substantially advanced knowledge about classroom communication processes. However, virtually all of this research and writing has focused on the nonverbal behaviors of teachers rather than of students (Andersen, 1979; Bassett and Smythe, 1979; Hurt, Scott, and McCroskey, 1978). Research focusing on the nonverbal behaviors of students would be of value both from a theoretical vantage point and as an aid to classroom teachers. Of particular importance to teachers would be knowledge about the development of nonverbal competence in children during elementary and secondary years. Recently, Cooper, Friedley, Stewart, and Tkachik (1980) have provided an important beginning by cataloging and summarizing research on the development of nonverbal communication competence in children. The purpose of the present study is to extend our knowledge of nonverbal competence in school children to many additional nonverbal behaviors across all of the school years from Kindergarten through High School.

In subsequent sections of the paper the development of nonverbal communication in school-age children will be discussed. Considerable literature exists on the development of nonverbal communication in infants and preschool children, but it is not summarized here, since it is beyond the scope of the present study.

Proxemic Development

More research has been conducted on the proxemic awareness and ability of school children than in any other area of nonverbal research. Methodologically, the studies are of two types: Studies which employ projective techniques such as picture-placing or feltboard figure manipulating tasks and actual behavioral observations of children. Since recent research has criticized the validity of projective techniques in the study of proxemic behavior in children (Aiello, 1980), these two bodies of literature will be examined separately.

Research employing projective techniques. Studies on pre-school and early elementary school children suggest that awareness of appropriate personal space increases with age. Melson (1976) found that both male and female preschool children could associate distance with affect. Four and six-year-old children showed an improvement over three-year-olds and placed greater distance between angry dyads than happy dyads. A study by Bass and Weinstein (1971) indicated that by five years of age social interpersonal distance behaviors had been acquired. Thus, kindergarten teachers should expect that some knowledge of distance will be manifested in their student behavior.

Similarly, interaction distance norms are learned developmentally. Bass and Weinstein found that the amount of space used by children increased each year from kindergarten through third grade. Research by Lerner, Karabeneck, and Meisels (1975) indicated that interpersonal interaction distance increased as grade level increased from kindergarten through third grade. Similarly, at all four grade levels, children placed same sex stimuli closer than opposite sex stimuli with this effect being more pronounced at higher grade levels (2nd and 3rd). In a study of developmental trends in personal space between grades one and six, Pedersen (1973) found males had a larger personal space than

females in all experimental conditions. This trend was most pronounced in the third grade and persisted through the sixth grade.

A series of studies using projective techniques by Guardo and associates yielded an inconsistent pattern of results. In three studies (Guardo, 1969, Guardo and Meisels, 1971b; Meisels and Guardo 1969) it was found that an inverse relationship existed between the amount of interpersonal distance and the degree of liking or acquaintance between partners in a dyad. This effect was observed from the third to the tenth grade and was more prevalent for girls. Boys were more effected by age than by relationship with more space being used as they grew older (Guardo and Meisels, 1971b). In a study inconsistent with most research, Meisels and Guardo (1969) found that children used less space as they moved from grades three through ten. As mentioned earlier, the validity of the projective technique in this study has been criticized; consequently, this anomalous finding may be due to an inadequate methodology (Love and Aiello, 1980). In a study of children from grades 3-10, Guardo and Meisels (1971b) observed that children in lower grades were interpersonally closer to parental figures than children in higher grades. Finally, Guardo (1976) found both boys and girls in the sixth grade used less interaction distance with same sex peers than opposite sex peers.

Research employing observational techniques. In addition to proxemic research employing projective techniques, considerable research particularly with elementary school children, has been reported using behavioral observations. Unlike the research employing projective techniques, this body of research has produced consistent findings. A group of studies clearly indicates that children use larger, more remote interaction distances as they get older. In a field of children's and adult's interpersonal spacing, Baxter (1970) found that children interacted at the closest distances, adolescents at intermediate distances, and adults at the greatest distances. A study of children's personal space by Lomranz, Shapira, Choresch and Gilat (1973) found that three-year-olds maintained closer distances from their peers than did five or seven-year-olds. An interaction effect for sex indicated that girls maintained closer distances than boys at ages 3 and 7 but not at age 5. In a study of children in grades 1-11 Aiello and Aiello (1974) found that children of both sexes used more interpersonal space as they grew older. They found gradual increases in space between grades 1 and 5, sharp increases between 5 and 7, and an interaction effect between sex and age with males assuming larger distances at the onset of puberty. Evidently seventh graders approximate adult proxemic norms. Finally, in a study of children in first, fifth, ninth and twelfth grades, Tennis and Dabbs (1976) findings concurred that interaction distances increase as children grow older. A significant interaction pattern that showed little sex differences in proxemics among young children and larger sex differences for older children, with males maintaining the greatest distances was also reported.

Variables other than age have also been found to effect proxemic behaviors of children. Eberts and Lepper (1975) report that the use of eye contact by adults when interacting with children significantly increased children's interaction distance. In a one month follow-up children's interpersonal distances were almost identical to the original study. The authors suggest that personal space represents a reasonably stable individual characteristic acquired early

in development. Jones and Aiello (1973) in a study of the body orientation and distancing of first, third and fifth grade children found that males maintain more indirect positions than females, and blacks maintain more indirect positions than whites. Young black children stand closer than young white children but these differences were reported to disappear by fifth grade. Aiello and Jones (1971) found that middle-class, white children stood further apart than lower-class black and Puerto Rican children. Raxter (1970) found that Mexicans maintain closer distances than Anglos who in turn maintain closer distances than blacks.

In an experimental study of reactions to children's personal space invasions, Fry and Willis (1971) asked children to stand close but not to touch ten different adults. Five-year-old children received a positive response when invading adults' space, eight-year-olds were ignored by adults and ten-year-olds received a negative response from adults.

In a study of spacial density in children, Loo (1972) found that significantly less aggression and social interaction occurred in high density (crowded) conditions than in low density conditions. However, girls showed no differences in aggression in either condition. In a similar study, McGrew (1970) manipulated density by social or spacial variables. Close proximity was significantly higher when density increased spacially and not higher when it was increased socially.

As stated previously, more research exists on the proxemic behavior of school children than in any other area of nonverbal communication. Nonetheless, a number of proxemic communication behaviors of school children have never been investigated. For example: (1) Are children of various grades sensitive to territorial markers? (2) Do children sit and stand closer than adults do at various grade levels? (3) When do children understand the concept of personal space and property. Thus, the first question posed in this study is:

Q₁: How do the proxemic behaviors of school children vary across grades K-12?

Haptic Development

Little research exists on the haptic or tactile behavior of school children. Kehrer and Tente (1969) studied younger (3-5 year olds) versus older (6-13) children's reactions to stress and frustration and found that self-adaptors (self-rubbing, kneading and scratching behaviors) were more frequent, less delayed and more spontaneous in younger children. Willis and Hoffman (1975) examined changes in frequency of tactile interaction of students in kindergarten through sixth grade. Results indicated that boys and girls in white and integrated schools showed a reduction in frequency of touch from kindergarten through sixth grade. In all black schools, however, no reduction in the frequency of touch occurred across the same period. The authors conclude that cross-sex and cross-racial touch was less frequent and that sexual and racial taboos are important factors in the development of tactile norms. Thus, a number of questions about the tactile development of school children remain, including: (1) When do children begin relating to one another in a

sexual way? (2) At what age do students like to be touched by their teacher? (3) At what grade levels is touch between students most common? (4) When are children most likely to express anger physically? (5) When are children most likely to tease other students by tickling them? Thus, the second question posed in this study is:

Q₂ How do the haptic behaviors of school children vary across K-12?

Oculesic Development

Research on oculesic development in children is sparse and inconsistent. In a study by Levine and Sutton-Smith (1973) it was reported that gazing increased from group 1 (4-6 years old) to group 2 (7-9 years old), decreased again for group 3 (9-12 years old) and increased for adults. Ashear and Snortum (1971) in a study of children from preschool, kindergarten, and second, fifth, and eighth grades found peak eye contact levels during kindergarten and second grade and a dip by the fifth grade. A third study by Scheman and Lockard (1979) found that most infants did not visually fixate on an observer, toddlers (18 months-5 years) stared for inordinate amounts of time and had difficulty averting gaze, and school-age children (5-9 years old) stared less than toddlers and averted gaze much like adults do. Additional research seems necessary to resolve the inconsistent findings reported in these three studies.

Developmental patterns in accurately perceiving eye contact is a second oculesic research area. The issue focuses on when individuals are able to differentiate eye contact from gazing at the face. Lord (1974) examined this question for second graders, sixth graders, and adults in Guatemala. Findings showed that discrimination was much more accurate for adults than sixth graders who in turn were more accurate than second graders, indicating that discrimination of eye contact is a learned ability that improves with age. In a similar study, Thayer (1977) reported that children were less accurate than adults in detecting eye contact from either an adult or another child peer. Since children were equally inaccurate with both adults and peers, Thayer (1977) suggested these errors were more likely perceptual rather than socially influenced.

Two studies (Ashear and Snortum, 1971; Levine and Sutton-Smith, 1973) found female children engage in more eye contact than male children. Finally, Post and Hetherington (1974) found that at age four neither girls nor boys were functioning above chance in the use of eye contact cues in judgements of affiliation. By age six girls alone were able to interpret eye contact cues of affiliation at above a chance level. A number of fruitful questions remain regarding the oculesic behavior of school children, including: (1) Does the amount of eye contact children exhibit as listeners differ by grade level? (2) Do children manifest conjugate lateral eye movements when thinking as do adults? (3) Do children flirt visually at various grade levels? These questions lead to our third general research question:

Q₃ How do oculesic behaviors of school children vary across grades K-12?

Research exists on several aspects of kinesic communication in school children. One area with considerable research available deals with the ability of children to send and receive facial expressions. In an early study of questionable methodological sufficiency, Gates (1923) suggested that facial expressions of laughter were understood by age three, pain by more than half of all six-years olds, anger by age seven, fear by age ten, surprise by age eleven, and scorn by 43% of eleven-year olds. More recently, Gilbert (1969) in a study of 4, 5 and 6 years-olds, found that as children grew older they developed a greater repertoire of affective concepts. Middle-class Jewish children were better recognizers of affect than lower class Gentile children. Since most affect is conveyed facially (Ekman and Friesen, 1975), it seems logical that recognition of facial affect would increase with age. Indeed, Walton (1973) studied nursery school, second-grade, and fifth grade children and found that accurate recognition of facial expressions and to a lesser degree, accurate production of facial expressions improved with age. These findings are quite similar to those of Odom and Leonard, (1972) who examined kindergarten and sixth grade children and found that older children produced more correct facial expressions and made more correct discriminations of facial affect as receivers. Additionally, they found the difference between discrimination and production increased with age, with production still lagging behind discrimination in the fifth grade. Two studies by Buck (1975, 1977) found large differences in facial sending ability between children (4-6 years old) but no systematic sex differences. Sending ability was positively related to teachers' ratings of activity level, aggressiveness, implusiveness, bossiness and sociability. Sending ability was negatively related to shyness, emotional inhibition and control. The latter study, (Buck, 1977) found communication accuracy is negatively correlated with age in both boys and girls. Additionally, it was found that even at an early age, boys began to conceal their responses to an emotion whereas girls did not do this. Similarly, Saarni (1979) found that ten-year-olds were more likely to use display rules and less likely to react with spontaneous facial expressions than were six or eight-year olds. The data indicated that with increased age children realize that internal emotional experience and external expression of affect need not correspond to each other.

Two studies of multi-channel communication indicate the importance of kinesic/visual information in development. Bugental, Kaswan, Love, and Fox (1970) examined children 5-18 years of age and found an age trend only for the visual and not for the vocal or verbal. Older children were more visually perceptive in receiving kinesic cues. Another study by Bugental, Kaswan, and Love, (1970) revealed that persons of all ages primarily use facial expression in resolving inconsistent messages. The study also found that children have difficulty understanding joking and sarcasm and are likely to assume the worst when judging conflicting messages.

Several studies have reported development data on the use of explicit gestures or emblems. Michael and Willis (1968) in a study of children with no school as compared to one year of school found that the school children were more accurate in the transmission and interpretation of explicit gestures (emblems) than children with no prior school. Likewise it was found that

middle-class children were more accurate than lower class children in both transmission and interpretation of such gestural information. Boys were more accurate than girls in interpretation of these gestures. In a second study, Michael and Willis (1969) found no differences between American and German children and no difference between males and females in ability to transmit and interpret gestures. Finally, in a study of emblematic gestures by Yumin and Lazer (1974) a significant increase in ability to encode and decode emblems was found between three year olds and four year olds. Additionally, both groups could decode more emblems than they could encode. Despite the availability of research on facial expressions and emblems additional questions on the kinesic communication skills of school children needs to be answered including: (1) Does the ability to use manipulative social smiling and frowning increase throughout the school years? (2) Do students at certain grade levels engage in excessive nervous fidgeting while in class? (3) At what grade-level do students begin to engage in back-channel behaviors such as nodding? These and other questions lead to the fourth general research question.

Q4 How do kinesthetic behaviors of school children vary across grades K-12?

Vocalic Development

The development of vocalic or paralinguistic ability has received preliminary research attention. Dimitrovsky (1964) in a study of children from kindergarten through seventh grade, found that increases in age, produced a significant increase in the ability of children to identify the emotional meaning of vocal expressions. Additionally, girls were generally more accurate at identifying emotions from vocal cues than were boys. In a study of elementary, junior high school, and high school children, Phillis (1970) found that the youngest children were most sensitive to vocal cues and discriminated most among voices with various vocal cues. In a study of children in the first, third, and fifth grade, Dittman (1972) reported older children are more likely to use vocal listener responses (yeah, uh-huh etc.), and all of the children's groups used these vocal cues less frequently than adolescents or adults.

Two other studies of children's paralinguistic behavior should be mentioned. Levin, Silverman, and Ford (1967) in a study of hesitations in children's speech, found that explanations by children produce more hesitations than descriptions. Finally, in a study of considerable relevance to classroom teachers, Kashinsky and Wiener (1969) found that middle-class kindergarten children responded similarly to a set of instructions presented in positive, neutral or negative tones of voice. Lower class kindergarten children responded differentially to the three tones of voice, responding most favorably to the positive tone of voice. Considerable research on the vocalic communication of school children remains to be done, including: (1) Do children of various grade levels use appropriate volume, speed, and pauses when talking? (2) Do children of various school grades seem unable to control giggling? (3) When are school children first able to understand sarcasm? To answer these and other questions the following research question is posited:

Q5 How do the vocalic behaviors of school children vary across grades K-12?

Development of Physical Appearance Perceptions

Substantial research has been conducted on school children's perception of physical appearance, particularly on perceptions of body type. Stafferi (1967) demonstrated that stereotypes regarding body types began to appear in children 4-5 years old. Specifically, he found that children 4-10 years old assigned positive qualities to mesomorphic (athletic) body types and negative qualities to endomorphic (rounded) and ectomorphic (thin, linear) body types. Similarly, Lerner (1969) reported that subjects age 10 to 20 had positive images of mesomorphs and negative images of ectomorphs and endomorphs. Moreover, he found little change in these stereotypes between age levels. A study by Lerner and Gellert (1969) found no consistent body build preference in kindergarteners but a distinct aversion to chubbiness. Lerner (1972) and Lerner and Horn (1972) in a study of children 6-20 years old found that as children aged a more progressively favorable view of mesomorphs developed, whereas ectomorphs and endomorphs were evaluated in progressively more negative terms. A recent study by Portnoy and Gardner (1980) examined children in kindergarten, third, and sixth grade. They found that negative perceptions existed for endomorph's physical, social and task attraction, intelligence and athletic ability. Mesomorphs were preferred by 3rd and 6th graders, but ectomorphs were preferred by kindergarteners. This literature seems to suggest that stereotypes regarding body type developed early and strengthened during childhood and adolescence.

The proxemic behavior of children toward endomorphs is consistent with other data. Lerner, Karabenick and Meisels (1975) is a study of children from kindergarten to third grade found that as grade increased so did subjects' use of space towards endomorphs, particularly female endomorphs. Similarly, Lerner, Vinning and Knapp (1975) found significantly greater space was maintained toward endomorphs than mesomorphs.

Several other studies have reported research on children's perceptions of physical attractiveness. Cavior and Lombardi (1975) showed photographs of children to other children ages 5-8, and studied the consistency (reliabilities) between children's perceptions of physical attraction. By age seven both boys and girls had high (.90 or greater) interrater agreement on physical attractiveness. The authors noted that this corresponded to Piaget's concrete operation stage. A study of 4, 5, and 6 year olds by Dion and Berscheid (1974) found that among young children unattractive females were more popular than attractive females or unattractive males. Similarly, attractive females were less popular than attractive males. For all groups, unattractive children, particularly males, were perceived to exhibit anti-social behavior. Data by Kleck, Richardson and Ronald (1974) from a study of 9-14 year old boys, supported the proposition that differences in perceived physical attractiveness are systematically related to social acceptance.

One final study by Feinman and Entwisle (1976) examined the ability of first, second, third, and sixth graders to recognize faces. They reported that facial recognition ability increased with each grade but leveled off between 3rd and 6th grade. This study attempts to examine additional questions regarding physical attraction in children, including: (1) Does concern about hair,

clothing, and neatness change during the school years? (2) When does attraction toward the opposite sex begin? (3) Does avoidance of endomorphs vary across grades? Thus the final question is:

Q6 How do perceptions of physical appearance vary across grade levels?

Methods and Procedures

This investigation examined teacher perceptions of the nonverbal communication behaviors which students typically engage in at various grade levels.

Subjects

The subjects in this study were 901 elementary and secondary school teachers from a four-state area. The sample consisted of the following number of teachers from each grade: kindergarten, 50; first grade, 89; second grade, 74; third grade, 86; fourth grade, 67; fifth grade, 55; sixth grade, 101; seventh grade, 53; eighth grade, 84; ninth grade, 57; tenth grade, 62; eleventh grade, 36; and twelfth grade, 87. The sample size varied slightly for the analysis of individual nonverbal behaviors, since some teachers omitted an item or two when completing the questionnaire. Of the teachers in this sample who reported their sex, 729 of them were female and 165 were male.

Questionnaire Construction, Dependent and Independent Variables

Teachers were asked to respond to a series of descriptions of nonverbal behaviors and indicate the approximate percentage of students in their grade who engaged in the described behavior. They were instructed to mark 100% if virtually all students engaged in the behavior, 75% if most students engaged in the behavior, 50% if about half engaged in the behavior, 25% if some but not half engaged in the behavior, and 0% if virtually none of their students engaged in the behavior.

The questionnaire consisted of a list of nonverbal behaviors which are the dependent variables in this investigation. The nonverbal behaviors selected for inclusion were generated by the researchers and based on the general topics reviewed in the literature review. Additional items focusing on nonverbal behaviors that are discussed in communication textbooks or nonverbal behaviors that have been commented on in previous teaching experiences were added to the questionnaire. As the literature review indicated, the development of nonverbal communication ability during the school years is not an extensively researched subject. This study was viewed as exploratory and the major criterion for dependent variables was that the list be extensive and diverse. Each item was treated as a separate dependent variable, since there was no previous theoretical or empirical rationale upon which to base data reduction to techniques or to create linear composites. For example, to suggest that all proxemic dependent variables create a linear composite would assume that various proxemic behaviors develop simultaneously, a position for which there is no evidence.

Sixty-four nonverbal behaviors were generated for the questionnaire. The 42 nonverbal behaviors related to the six topic areas discussed in this

literature review were analyzed for this study. The other areas will be reviewed and analyzed in a subsequent paper. Additionally, demographic information including the students' social class and an urban/rural/suburban breakdown as perceived by the teachers was also collected and will be reported elsewhere.

The independent variable for all analyses was the grade level taught by teacher. As stated previously, teachers were instructed to report what percentage of their students engaged in each nonverbal behavior. Grade level of the teacher, therefore, served as the developmental marker to view the acquisition and/or cessation of student nonverbal behaviors.

Procedures

The two-page questionnaire was distributed to teachers who were enrolled in graduate-level continuing education courses. There were approximately 35 teachers per class. No subject identification was requested, so all responses were anonymous. Instructions were included on the questionnaire, and most people completed the questionnaire in 10 to 15 minutes.

Reliability of Instrument

Since each dependent variable was measured by a single-item scale, traditional tests of reliability were impossible. To check for internal consistency, one item on the scale was asked twice. The behavior was what percentage of students avoid overweight children, and it was item 43 and item 58. The correlation between these two items was .93, suggesting very high internal consistency. Two other items (items 15 and 26) were very similar in that one was "will avoid sitting at a desk with other's belongings on it" and the other item was "avoid a seat occupied by another's book or jacket." These items were correlated .76. Another set of items (items 29 and 41) differed only in that one asked "stand closer to you than adults do when talking" and the other asked "sit closer. . . ." These were correlated .66. Finally, two items which read very similarly but actually test different concepts were only correlated .48. They were items 14 and 31, and they were "look at you when they talk" and "look at you when you talk." These several inter-item correlations are pointed out to demonstrate that teachers seem to be responding most consistently to identical items, next most consistently to similar concepts, and less consistently to semantic structures. Items next to each other but not similar in concept were not highly correlated and in fact were often not even related at statistically significant levels. Together this evidence suggests good instrument reliability.

Statistical Analysis

The mean percentage level of students reported to be engaging in each nonverbal behavior at each grade level is reported. The variance in each of the dependent variables explained by grade level was calculated by using both regression analyses and analyses of variance. These procedures yielded R^2 and η^2 variance estimates. Linear trend analyses (Kerlinger & Pedhazur, 1973) were also performed to test first whether the relationship had a significant linear component, then to test for significant nonlinear components, and

finally to test for curvilinear components. Alpha level for all tests of statistical significance was computed at the .05 level, two-tailed. Power analysis (Cohen, 1977) was also computed. For all comparisons the power for detecting small effects was .45 when using analysis of variance models, and it was .91 when using correlation or regression models. Power was in excess of .995 for detecting medium and large effects for both the regression and ANOVA models.

Results and Discussion

For proxemic, physical appearance, haptic, and vocalic variables, nearly every relationship surveyed indicated significant developmental patterns. For the kinesic variables, about half of the behaviors surveyed indicated significant developmental trends, while almost none of the oculesic variables demonstrated significant developmental patterns. Mean percentages by grade level for each nonverbal behavior are reported in Tables 1-6, along with regression analysis and analysis of variance results. In this section of the paper, results for each nonverbal topic area will be reported and interpreted. Before reporting results for each variable, the overall pattern of results and a comment about the nature of nonlinearity and curvilinearity need to be discussed.

Overall, linear trend analyses revealed that whenever there was a significant relationship between the dependent variable (a given nonverbal behavior) and the independent variable (teacher grade level for observation of the student nonverbal behavior), the relationship had both significant linear and significant nonlinear components.¹ A visual examination of the percentage means for some nonverbal behaviors may make this finding appear surprising, since some means indicate a continual developmental progression (e.g., item 46). However, progression should not be equated with linearity, since linearity assumes progressions of equal intervals. Curvilinearity was also tested, and whenever results suggested a significant curvilinear component, it is indicated in this section.

Proxemics

Eight proxemic behavioral variables were examined in this study (see Table 1). Items 15, 26, and 47 dealt with the acquisition of knowledge about territorial markers. For all three items, results showed significant development increases across grade levels in awareness of territorial markers. Grade level accounted for 9% to 20% of the variance in behavioral awareness of territorial markers. For item 47, a significant curvilinear trend was observed as well ($F = 35.33$, $p < .0001$, $R^2 = .03$), indicating that saving seats using books and jackets peaks at seventh grade and then declines slightly.

Four variables (items 19, 29, 35, and 41) examined students' awareness of interpersonal distance. For each variable, results showed significant decreases in interpersonal distance with advances in grade level. Grade level accounted for 8% to 18% of the variance in interpersonal distance. Three of these four variables (items 19, 35, and 41) showed significant curvilinear trends as well, but the variance accounted for by the curvilinear model was 1% or less.

Last, one item (item 37) dealt with students' ability to understand the concept of personal property. Significant linear, nonlinear, and curvilinear relationships were all observed, but the linear and curvilinear components only predicted 1% and .4% variance, respectively. The η^2 was .06, indicating some significant variation between grade levels, but the pattern is less clear.

Haptics

Ten haptic behavioral variables were examined in this study (see Table 2). Three items (items 24, 32, and 76) dealt with the extent of student-initiated touching behaviors. Results indicated significant decreasing pattern of student-initiated touching behavior as school grade increased. Grade level predicted between 10% and 17% of the variance in the amount of student-initiated touch. Item 76 also had a significant curvilinear component, but it accounted for only 1.4% variance ($F = 14.26$, $p < .002$).

Two additional haptic items dealt with students touching behavior but specified sexual (item 21) or intimate (item 50) behaviors. Sexual touch increased as grade level increased, accounting for 24% of the variance in this behavior. Intimate touch also changed developmentally, but the pattern of means indicated an initial decline during the primary grades with a progressive increase after fifth grade. The curvilinear component for intimate touch was significant ($F = 14.53$, $p < .001$, $R^2 = .02$). The linear regression model showed that grade level accounted for 3% of the variance and the ANOVA model accounted for 7% of the variance in intimate touch.

Two items surveyed how students like being touched by teachers (item 22) and by other students (item 56). Results indicated students liked teacher touch significantly less as grade level increased, with 33% to 37% variance explained by grade level. Liking to be touched by other students differed developmentally, but the linear component was not statistically significant. A significant curvilinear trend was indicated ($F = 17.23$, $p < .0001$, $R^2 = .02$), and the analysis of variance indicated grade level differences accounting for 4% of the variance. The pattern of means demonstrates an overall decrease in liking to be touched until about seventh grade, with several slight fluctuations, and then a slight trend toward greater liking of touch late in high school.

One item (item 74) examined the amount of self-touching and no developmental differences were found. About 40% of students at all grade levels engaged in self-touch frequently. As indicated in the methods section, power for medium and large effects was in excess of .995, so nonsignificant findings argue rather strongly for a lack of a developmental pattern for this behavior.

Finally, one haptic item dealt with teasing students by tickling them (item 59) and another dealt with expressing anger physically (item 44). A significant developmental decrease was found for both behaviors, but grade level only predicted 1% to 4% of variance.

Oculesics

Four items dealt with oculesic behavior and three of them did not indicate developmental patterns (see Table 3). Approximately 75% of students at all grade levels are reported to look at teachers when they talk (item 14) and approximately 70% of students are reported to look at teachers when the teachers talk (item 31). About 55% of students at all grades are reported to move their eyes when thinking (item 42). Given the high statistical power of this study for large and medium effects (greater than .995), it is unlikely that an obvious developmental pattern exists for these variables. Flirting (item 72), however, is a behavior which developmentally differs rather substantially. Thirty-four to 36% of the variance in flirting is predicted by grade level, with flirting steadily increasing at least until eighth grade. The data also indicated a significant curvilinear component, but the R^2 was less than .5%. This curvilinear component is manifested by a slight decline in flirting in ninth grade and then a slight increase thereafter.

Kinesics

Among the seven variables which focused on kinesic behaviors (see Table 4), three indicated no developmental pattern. About 35% of students at all grade levels are perceived to frown to get their way (item 64). Approximately 50% of students are perceived as correctly interpreting others' emotional expressions (item 70) and as providing feedback to teachers when teachers talk (item 66). The highly sufficient statistical power of this study would have made any moderate developmental trends reach statistical significance.

A developmental trend was significant for kinesic emotional expression in that the percentage of students who expressed emotions through actions (item 69) decreased as student grade level increased ($R^2 = 5-6\%$). Another kinesic item dealt with excessive fidgeting (item 34), and it was also developmentally significant. The percentage of students fidgeting declined after kindergarten and in fifth and eighth grades, but the pattern is inconsistent. The analysis for curvilinearity revealed a nonsignificant curvilinear component. The linear component only accounted for 1% variance, but the categorical ANOVA procedures attributed 6% of the variance in fidgeting to grade level.

Two kinesic items dealt with smiling. Smiling when students want their way (item 25) increased significantly, but only slightly as grade level increased. The pattern of means suggests somewhat random fluctuations, and grade level only predicted .5% to 2% of variance in this behavior. The percentage of students smiling often in school (item 67) significantly decreased as grade level increased, with grade level predicting 3% to 5% variance. The data also indicated a significant but small curvilinear component ($F = 6.22$, $p < .02$, $R^2 = .007$). The pattern of means suggests smiling decreases until seventh grade, increases slightly in eighth grade, decreases in ninth and tenth grade, and then increases slightly again during eleventh and twelfth grade.

Vocalics

Six items surveyed teachers' perceptions of students' vocalic behaviors (see Table 5). Two vocalic items dealt with understanding sarcasm (items 40

and 60), and these indicated significant developmental increases in this ability. Twenty-four to 27% of the variance in understanding sarcasm is predicted by grade level, and 11% to 13% variance is explained by grade level for the item which gave a vocalic example of sarcasm (item 60). Both of these items had a significant nonlinear component ($F = 15.60$, $p = .001$; $F = 12.33$, $p = .005$), but it only accounted for 1% variance in the pattern. The pattern of means for both items does indicate a slight dip in the percentage of students understanding sarcasm in seventh grade, with a relatively large upturn after eighth grade.

Use of an appropriate speech rate (item 55), appropriate loudness (item 33), and appropriate pauses (item 20) were also examined. Significant developmental trends were observed for all three vocalic behaviors. Speech rate and pause placement were viewed as being more appropriate as the grade level of the student increased, with grade level predicting between 3% and 5% variance. Use of appropriate vocal loudness (item 33) showed slight developmental differences, but the linear component only predicted .5% variance. A curvilinear component was not significant, but the analysis of variance indicated grade level differences accounting for 3% variance in appropriate loudness. A clear pattern is not evident in the mean percentages for grade level.

Another vocalic item dealt with excessive giggling (item 36). Results indicated nonsignificant linear and curvilinear developmental patterns. However, the analysis of variance indicated 5% of the variance in giggling was predicted by grade level. The means indicate peaks in kindergarten and junior high school.

Physical Appearance

Eight items surveyed physical appearance variables. Two identical items (item 43 and 58) used to estimate internal reliability, as explained in the methods section, dealt with avoiding overweight children. There was a significant developmental pattern in this behavior, with avoidance of overweight children increasing as grade level increases. Grade level explained 5% to 13% variance in this behavior. There was also a significant curvilinear component to this relationship ($R^2 = .04$, $F = 38.66$ and 38.41 , $p < .0001$); the means suggest this avoidance behavior peaks around eighth grade and then declines somewhat.

Two physical appearance items which focused on concern over hair style (items 46 and 57) indicated significant developmental increases, with grade level predicting 35% to 44% variance. Analysis for curvilinearity also indicated significant curvilinear components ($F = 54.28$, $p < .001$, $R^2 = .04$; $F = 34.07$, $p < .001$, $R^2 = .02$), but the pattern of means did not suggest any obvious dips or peaks.

Concern about clothing (item 16) also showed a significant increase, with grade level predicting 11% to 13% variance. A significant but small curvilinear component was indicated ($F = 6.11$, $p < .02$, $p^2 < .01$), and the pattern of means suggests a decrease in concern about clothing only in fifth grade. Staying neat and clean all day (item 27) also showed a significant developmental increase. Grade level accounted for 21% to 22% variance in this behavior.

Wearing jewelry (item 54) is another potential manifestation of concern about personal appearance, and it also showed the same significant developmental increase. Twenty-nine to 31% of the variance in wearing jewelry is explained by grade level.

The final physical appearance item, attraction to persons of the opposite sex (item 28), increased as grade level increased. Grade level accounted for 39% to 41% of the variance in attraction to the opposite sex.

Conclusion

These data suggest some important developmental trends in the acquisition and use of various nonverbal behaviors by school children. The most serious misinterpretation of these results would be to suggest that the teacher perceptions reported in this study are a substitute for more objective, scientifically recorded observations of student behaviors.

These data provide direct evidence of what teachers perceive to be the communication behaviors of their students. This information is useful for two purposes. First, it provides a beginning framework from which to study nonverbal communication development and competence. These results suggest nonverbal areas which may be most fruitful for developmental investigation, and they provide some indication of potential norms for the manifestation on nonverbal behaviors.

Second, these results provide a great deal of information about how teachers perceive the communication behaviors of their students. Actual observations of the students will determine if the teacher's perceptions are correct or incorrect. However, the issue of the correlation between teacher perception of student behaviors and actual student behaviors in no way reduces the importance of understanding teacher perceptions. Knowledge about teacher perceptions of communication is important heuristically and pragmatically. It has pragmatic importance in understanding teachers' baseline awareness of student nonverbal behavior.

The issue of whether teachers are good observers and reporters of student communication ability is an important question which needs to be addressed. Intuitively appealing arguments for either the validity or invalidity of teacher observation can be constructed. However, this is an empirical issue, not a philosophical one. Future research needs to address this issue, and this study has provided an important first step.

FOOTNOTE

¹Results for each of these analyses are too cumbersome to report here. Anyone wishing further information on these results should write the authors. The test for nonlinearity followed the procedures suggested in Kerlinger and Pedhazur (1973, p. 204).

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Table 1

Means, Regression Analyses and
Analyses of Variance for Proxemic Variables

Item	What Percent of Students:	Mean Percent for Each Grade												Regression Analysis			Analysis of Variance			
		K	1	2	3	4	5	6	7	8	9	10	11	12	F	P	R ²	F	P	Eta ²
15	will avoid sitting at a desk with other's belongings on it	53	49	40	49	47	49	52	63	61	68	71	69	66	89.69	.0001	.09	9.12	.0001	.11
19	sit closer together than adults do	87	81	76	69	65	68	63	60	64	57	65	57	59	82.88	.0001	.08	9.24	.0001	.11
26	avoid a seat occupied by another's book or jacket	36	52	43	53	54	50	55	62	65	65	68	73	69	85.14	.0001	.09	8.48	.0001	.10
29	stand closer to you than adults do when talking	82	80	71	72	68	66	64	61	63	55	56	52	54	125.65	.0001	.12	11.08	.0001	.13
35	stand closer together than adults do	79	76	65	69	67	65	62	56	64	56	59	57	56	65.74	.0001	.07	7.11	.0001	.09
37	understand the concept of personal property	55	63	64	72	71	64	76	66	67	65	66	79	71	9.05	.01	.01	4.50	.0001	.06
41	sit closer to you than adults	82	78	71	67	61	65	60	54	68	47	50	48	50	172.89	.0001	.16	16.28	.0001	.18
47	save seats by using books and jackets	15	21	26	35	39	46	51	61	59	54	50	59	56	164.34	.0001	.16	18.06	.0001	.20

Table 2

Means, Regression Analyses and
Analyses of Variance for Haptic Variables

Item	What Percent of Students:	Mean Percent for Each Grade												Regression Analysis			Analysis of Variance			
		K	1	2	3	4	5	6	7	8	9	10	11	12	F	P	R ²	F	P	Eta ²
21	relate to peers in a sexual way	17	20	26	25	31	31	36	45	48	53	56	52	58	272.18	.0001	.24	23.36	.0001	.24
22	like to be touched by their teacher	84	78	75	72	57	60	50	36	40	35	37	34	36	440.96	.0001	.33	42.55	.0001	.37
24	touch other students	78	77	72	76	66	66	63	63	62	58	56	58	58	98.43	.0001	.10	9.32	.0001	.11
32	restrict touch to close friends and family	26	27	32	34	42	30	43	47	46	51	44	52	58	158.90	.0001	.15	14.46	.0001	.17
44	express anger physically	61	51	43	44	49	46	47	46	48	47	37	39	41	17.01	.0001	.02	3.27	.0001	.04
50	touch other students intimately	32	22	22	17	19	23	26	28	30	30	31	31	38	30.62	.0001	.03	5.06	.0001	.07
55	like to be touched by other students	61	48	44	52	43	48	46	43	47	46	48	50	54	.08	NSD	—	2.98	.0004	.04
59	tease other students by tickling them	20	24	25	23	26	22	23	20	27	25	16	15	16	12.73	.0004	.01	2.50	.0004	.03
74	touch themselves frequently	42	45	36	37	39	36	39	40	48	43	44	37	44	1.92	NSD	—	1.45	NSD	—
76	are cautious who they touch, when and where	28	37	37	46	47	49	52	52	52	58	58	54	57	96.12	.0001	.01	9.67	.0001	.12

Table 3

Means, Regression Analyses and
Analyses of Variance for Oculoric Variables

Item	What Percent of Students:	Mean Percent for Each Grade													Regression Analysis			Analysis of Variance		
		K	1	2	3	4	5	6	7	8	9	10	11	12	F	P	R ²	F	P	Eta ²
14	look at you when they talk	78	81	79	80	78	77	81	79	78	79	80	77	81	.03	NSD	—	.55	NSD	—
31	look at you when you talk	77	76	71	73	72	73	78	70	71	74	75	74	75	.02	NSD	—	1.44	NSD	—
42	move their eyes when they are thinking	61	55	54	59	59	61	59	53	60	56	50	54	58	.46	NSD	—	1.33	NSD	—
72	flirt	19	24	26	29	35	40	45	58	60	58	59	62	66	452.37	.001	.34	40.34	.0001	.34

Table 4

Means, Regression Analyses and
Analyses of Variance for Kinesthetic Variables

Item	What Percent of Students:	Mean Percent for Each Grade													Regression Analysis			Analysis of Variance		
		K	1	2	3	4	5	6	7	8	9	10	11	12	F	P	R ²	F	P	Eta ²
25	smile when they want "their way"	58	59	64	66	56	56	63	58	66	63	63	68	66	4.36	.04	.005	1.80	.05	.02
34	fight excessively when sitting in class	53	41	43	37	36	30	36	44	43	44	39	30	36	6.11	.02	.01	4.57	.0001	.06
64	frown to try to get their way	38	32	29	34	39	33	34	36	39	36	34	34	39	3.35	NSD	—	1.54	NSD	—
66	provide feedback such as nodding, when you talk	49	51	46	54	51	52	48	47	51	46	49	47	55	.05	NSD	—	1.07	NSD	—
67	smile often school	74	72	69	68	69	66	66	59	66	61	59	64	64	30.89	.0001	.03	3.99	.0001	.05
69	express emotions through action	76	70	65	67	65	61	61	62	64	58	55	60	55	47.27	.0001	.05	5.00	.0001	.06
70	correctly interpret other's emotional expressions	54	55	50	59	53	54	51	51	54	51	56	63	55	.68	NSD	—	1.65	NSD	—

Table 5

Means, Regression Analyses and
Analyses of Variance for Vocalic Variables

Item	What Percent of Students:	Mean Percent for Each Grade													Regression Analysis			Analysis of Variance		
		K	1	2	3	4	5	6	7	8	9	10	11	12	F	P	R ²	F	P	Eta ²
20	pause in appropriate places when talking	41	49	47	57	51	49	54	55	53	52	55	64	60	25.35	.0001	.03	3.78	.0001	.05
33	use appropriate loudness when talking	53	58	55	56	57	53	59	57	51	53	60	66	60	4.09	.05	.005	1.90	.04	.03
36	giggle excessively	43	39	36	34	35	34	38	47	50	45	36	29	35	.14	NSD	—	3.62	.0001	.05
40	understand sarcasm	14	30	26	39	46	49	52	51	56	55	57	64	66	275.72	.0001	.24	26.59	.0001	.27
55	use an appropriate rate of speech	56	55	54	61	58	60	61	56	62	63	65	69	68	34.59	.0001	.04	3.77	.0001	.05
60	understand when you say "that's good" in a voice that mean "that's bad"	23	30	36	44	46	50	53	48	53	58	56	63	59	106.38	.0001	.11	10.72	.0001	.13

Table 6

Means, Regression Analyses and
Analyses of Variance for Physical Appearance Variables

Item	What Percent of Students:	Mean Percent for Each Grade													Regression Analysis			Analysis of Variance		
		K	1	2	3	4	5	6	7	8	9	10	11	12	F	P	R ²	F	P	Eta ²
16	are concerned about their clothing	45	47	47	55	57	52	62	66	65	67	69	68	68	112.48	.0001	.11	10.72	.0001	.13
27	stay neat and clean all day	32	32	32	43	40	39	46	48	51	57	59	65	62	235.27	.0001	.21	20.82	.0001	.22
28	are attracted to persons of the opposite sex	31	34	31	39	38	46	52	60	63	74	78	79	80	576.72	.0001	.39	50.90	.0001	.41
43	avoid overweight children	18	25	40	33	44	43	44	41	53	50	44	37	43	50.88	.0001	.05	9.66	.0001	.12
46	comb their hair in the restroom	05	15	25	32	44	50	53	63	65	73	68	69	71	584.97	.0001	.40	56.64	.0001	.44
54	wear jewelry	35	29	33	42	41	45	50	61	60	65	61	71	68	353.69	.0001	.29	32.05	.0001	.31
57	are concerned about hair styles	29	30	32	43	50	58	65	65	70	71	72	77	75	474.15	.0001	.35	45.16	.0001	.38
58	avoid overweight children	15	24	36	31	44	40	43	39	53	48	43	48	43	65.61	.0001	.07	11.00	.0001	.13